

CLAIMS:

We claim:

1. A trailer for transporting cylindrical bales, the trailer comprising:

a frame, and a hitch attached to a front end of the frame and adapted for attachment to a towing vehicle for movement in an operating travel direction;

a conveyor chain operatively mounted on the frame and oriented substantially parallel to the operating travel direction;

means to support and maintain a plurality of bales on a top load engaging face of the conveyor chain as the top load engaging face of the conveyor chain moves rearward;

wherein the load engaging face of the conveyor chain includes means to create a high friction interface

between the load engaging face and an outer surface of each bale substantially without protruding into the bale such that the bales move rearward with the load engaging face of the conveyor chain unless obstructed, and such that the load engaging face can slide with respect to the bales when movement of the bales is obstructed.

2. The trailer of Claim 1 wherein the means to support and maintain a plurality of bales comprises a rail oriented parallel to the conveyor chain above and on each side of the conveyor chain.

3. The trailer of Claim 1 wherein the means to create a high friction interface between the load engaging face and an outer surface of each bale comprises a plurality of resilient pads having a roughened surface.

4. The trailer of Claim 3 wherein the load engaging face of the conveyor chain comprises at least two resilient pads attached to the conveyor chain adjacent to each other, and wherein each resilient pad is attached at a rear end thereof to a link of the conveyor chain, and wherein a

front end of one resilient pad rests on top of the rear end of an adjacent resilient pad.

5. A trailer for transporting cylindrical bales, the trailer comprising:

a frame, and a hitch attached to a front end of the frame and adapted for attachment to a towing vehicle for movement in an operating travel direction;

a pair of substantially parallel rails attached to the frame and substantially aligned with the operating travel direction;

a conveyor chain oriented parallel to the rails and located between and below the rails such that a bale can rest on a top load engaging face of the conveyor chain and be maintained in position by the rails, wherein the top load engaging face of the conveyor chain moves rearward and carries bales resting thereon rearward;

wherein the load engaging face of the conveyor chain

comprises a plurality of resilient pads having a roughened surface to increase friction between the pads and an outer surface of the bale substantially without protruding into the bale such that the load engaging face of the conveyor chain can slide with respect to the bale when movement of the bale is obstructed.

6. The trailer of Claim 5 wherein bales are oriented such that cylindrical axes thereof are substantially aligned with the rails.

7. The trailer of Claim 5 wherein a distance between the rails is adjustable.

8. The trailer of Claim 5 wherein the load engaging face of the conveyor chain comprises at least two resilient pads attached to the conveyor chain adjacent to each other, and wherein each resilient pad is attached at a rear end thereof to a link of the conveyor chain, and wherein a front end of one resilient pad rests on top of the rear end of an adjacent resilient pad.

9. The system of Claim 8 wherein resilient pads are attached along the entire length of the conveyor chain adjacent to each other, and wherein each resilient pad is attached at a rear end thereof to a link of the conveyor chain, and wherein a front end of one resilient pad rests on top of the rear end of an adjacent resilient pad.

10. The trailer of Claim 5 wherein the resilient pads are at least three inches wide.

11. The trailer of Claim 5 wherein the resilient pads are rubber pads.

12. A trailer for loading and transporting cylindrical bales, the trailer comprising:

a frame, and a hitch attached to a front end of the frame

and adapted for attachment to a towing vehicle for movement in an operating travel direction;

first and second conveyors oriented longitudinally along respective first and second sides of the frame such that

a cylindrical bale can rest on each conveyor;

a first loading arm operative to raise a first bale from the ground and position the first bale on the first conveyor;

a second loading arm operative to raise a second bale from the ground and position the second bale on the second conveyor beside the first bale;

a third loading arm operative to raise the first bale from the first conveyor to a height sufficient to allow the first loading arm to raise a third bale from the ground and position the third bale on the first conveyor, the third loading arm further operative to lower the first bale to rest on the second and third bales;

wherein the first and second conveyors move substantially in unison to move the first, second, and third bales along the frame.

13. The trailer of Claim 12 wherein bales are oriented

on the conveyors such that a longitudinal axis of the bales is substantially aligned with the operating travel direction.

14. The trailer of Claim 12 wherein the first, second, and third loading arms are located in proximity to the front end of the frame such that the first, second, and third bales are positioned by the loading arms at front ends of the first and second conveyors, and wherein the conveyors move the bales rearward.

15. The trailer of Claim 14 wherein at least one of the first and second loading arms comprises a pair of spaced apart prongs extending forward from the loading arm such that the prongs can be positioned adjacent to the ground to engage opposite sides of a bale resting on the ground as the trailer moves forward.

16. The trailer of Claim 14 wherein the third loading arm comprises a pair of spaced apart prongs extending rearward from the third loading arm such that when the first bale is resting on the first conveyor after being

positioned by the first loading arm, the prongs on the third loading arm extend rearward under opposite sides of the first bale.

17. The trailer of Claim 16 wherein the third loading arm is pivotally attached to the front end of the frame adjacent to a side of the frame opposite to the first loading arm

18. The trailer of Claim 12 wherein at least one of the first and second conveyors comprises a pair of substantially parallel conveyor rails attached to the frame and substantially aligned with the operating travel direction, and a conveyor chain oriented parallel to the rails and located between and below the rails such that a bale can rest on a top load engaging face of the conveyor chain and is maintained in position by the rails, and such that as the top load engaging face of the conveyor chain moves, the bale moves rearward.

19. The trailer of Claim 18 wherein the load engaging face of the conveyor chain comprises a plurality of

resilient pads having a roughened surface to increase friction between the pads and an outer surface of the bale substantially without protruding into the bale such that the load engaging face of the conveyor chain can slide with respect to the bale when movement of the bale is obstructed.

20. The trailer of Claim 19 wherein the load engaging face of the conveyor chain comprises at least two resilient pads attached to the conveyor chain adjacent to each other, and wherein each resilient pad is attached at a rear end thereof to a link of the conveyor chain, and wherein a front end of one resilient pad rests on top of the rear end of an adjacent resilient pad.